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## Improving the Inhaler

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**Project Title:** Improving the Inhaler

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**Background:** Inhalers used to dispense various pharmacological agents play an important role in the care of patients with pulmonary disease. These pharmacological agents can be very effective, however, many patients that use inhalers often deliver these drugs incorrectly or in a sub-optimal manner. Our project aims to improve the design of the inhaler in order to increase the effectiveness of drug delivery and also ease of patient use.

**Methods:** We interviewed a critical care pulmonologist regarding patient inhaler use and compliance. This physician offered information about proper inhaler use and described common errors that patients encounter when attempting to dispense drugs via inhalers. Both steroidal and albuterol inhalers that are currently being prescribed were allocated for our examination and use to help develop a more user friendly model.

**Results:** The pulmonologist illustrated several errors that patients will commonly make which can degrade the efficacy of the inhaled drug delivery. One frequently encountered error was that drug is dispensed by the patient once they had already reached their total lung capacity, or inhaled fully. This sort of error leads to the drug being dispensed into the throat and failure to reach the intended target, the lungs. Additionally, the physician noted that patients often forget to administer their inhaled drugs because the inhaler does not fit comfortably into the patient's pocket and so it is not optimally portable.

**Conclusion:**

Our research suggests that inhaler design could be improved in order to increase the effectiveness of drug delivery and patient compliance. We are considering incorporating audible actuation clues that will alert the patient when to dispense the drug, and also provide electronic feedback to the patient's mobile device. This would help educate the patient on how to coordinate their breathing with actuation of the device to dispense the medication.

**Word Count:** 292 words